*Has the standard textbook model
been wrong all these years?*

The Myth of Copyright Inefficiency

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Economic analyses of copyright and patents most often focus on balancing what is known as the incentive/access tradeoff. Intellectual property laws increase incentives for creation by granting an exclusive right to sell copies of the particular intellectual property, generating greater profits with which to cover the costs of creating the work. But the exclusivity is presumed to increase the price of copies of the intellectual work, and that presumably decreases consumption of the copies.

Virtually all economic discussions of intellectual property law and its alternatives depend on the size of the incentive/access tradeoff. How much of a deadweight loss do intellectual property laws create on the access side of the market? How much incentive do they provide, and how is that incentive transformed into actual creation?

This article describes my research on the existence and size of the monopoly price differential caused by copyright in the case of books and the size of any concomitant deadweight losses. I find two somewhat different results of copyright's effect on book prices, depending on the weights given to different books in the statistical analysis. The first result, which comes from treating each title equally (as analysts commonly do), finds that copyright does not raise price and that there is no monopoly deadweight loss. The remarkable implication of this result is that increases in copyright unambiguously enhance economic efficiency. The second result, in which titles are weighted by the num-

ber of units sold, finds that copyright increases price by a modest amount, which is generally about the same percentage of revenues as typical royalty payments. This implies that any economic rents in publishing go to authors. An examination of the size of the deadweight loss resulting from this increased price indicates that it is quite small in absolute terms and much smaller than the deadweight losses that might be expected under proposed alternatives to copyright.

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COPYRIGHT 'MONOPOLY'

Economists, along with almost everyone else, tend to equate intellectual property protection with monopoly. But authoring and publishing are really two separate markets, and either could be monopolistic or competitive. It is easy, for example, to imagine an industry in which publishers wield no monopoly power. Authors would reap any excess profits from the sales of their books and, indeed, the entire industry rent would go to those authors with hard-to-replace talent. A more common and opposite view is that copyright industries consist of large, powerful corporations that usurp most of the industry rents, leaving the creative artists with little to show for their efforts. But if the publishing industry were a pure monopoly, there would be no need for copyright at all because there would be only a single seller of any (and every) title, making copyright redundant.

Regardless of where the locus of monopoly might be housed, economists have been unanimous in their depiction of copyright as providing a monopoly deadweight loss on the consumption side of this market. The deadweight loss involves consumers who would like to consume the work but are restricted from doing so by the supra-competitive price in the market engendered by copyright.

METHODOLOGY To test whether this depiction is correct, I examined best seller lists from long-ago decades (1895 to 1940) in order to generate a list of book titles. I then collect-

they entered the public domain before the 1978 and 1998 laws took effect (despite those laws' retroactive provisions). Further, some books published after 1922 may not have had their copyright renewed after the first 28-year period, and they too are now part of the public domain despite the 1978 and 1998 laws. For my research, I considered all books published before 1923 to no longer be under copyright. I also examined all books published after 1922 to see whether the copyright was renewed; if it was not, the book was deemed to no longer be under copyright. Similarly, I checked to see if the author had died early enough for copyright to expire.

Because all the titles were well over half a century old and all were former bestsellers often written by famous authors, there was no reason to expect the nature of the titles under copyright to be different in important respects from those that had lost copyright protection. Those books not renewed might be somewhat different because the lack of renewal likely indicates the expectation of less robust sales. This implies that treating those books the same as non-copyrighted books would increase the size of any price difference attributable to copyright, given that higher demand leads to higher prices and those books for which copyright was renewed would tend to be the more successful sellers.

From *Books in Print* came the list price of the book, the number of pages, the type of binding, the publisher, the ISBN number, and other special characteristics such as whether the

MORGAN BALLARD
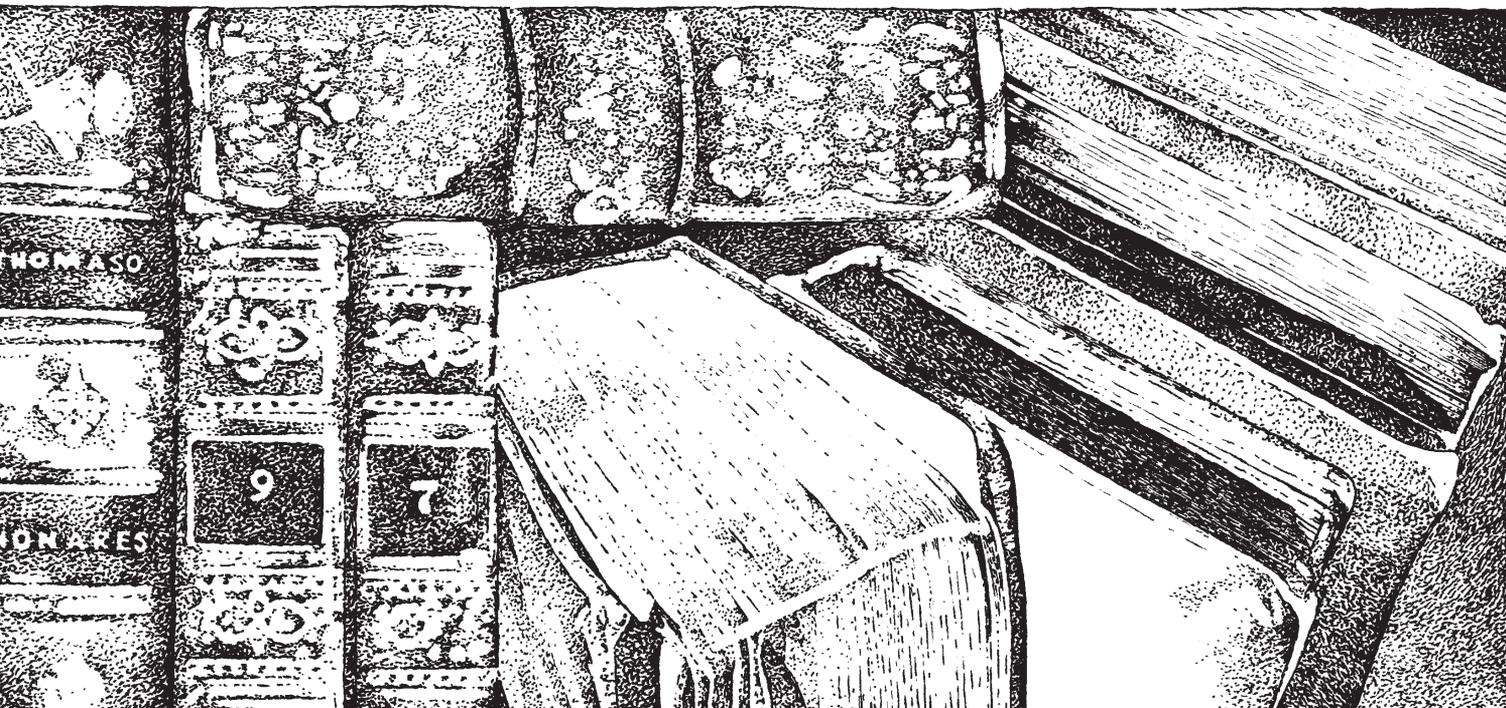
ed additional information on each title on the list, including whether the title was currently under copyright, the number of pages in the book, the binding type, and so forth.

Prior to 1978, books were copyrighted for 28 years, with the possibility of one 28-year renewal. After 1978, copyright was extended (retroactively) to the author's life plus 50 years, and after 1998 to the authors' life plus 70 years. Therefore, books copyrighted before 1923 have now lost their copyright because

book had large type, was illustrated, was a special edition, was a textbook, was for juveniles, and so forth. I obtained the selling price and sales rank from Amazon.com. I also examined best sellers from the 2002–2004 period to see how new bestsellers might differ from old bestsellers.

INITIAL DATA One question related to the issue of whether copyrighted books are likely to have higher prices is whether

books of a particular binding-type tend to have the same prices. In related markets, for example, CDs tend to have similar list prices, movie admission prices in a multiplex do not depend on the particular feature being shown, and iTunes charges the same price for all songs (until recently, at least).

The box plots in Figure 1 indicate that for the major binding-variants of recent bestsellers, prices were tightly grouped — especially for mass-market paperbacks (24 out of 27 were exactly $7.99, with the other three at $7.50). The prices of other paperbacks are also tightly concentrated at around $15, although there is somewhat greater variation, most likely from the greater variation in types of books in this classification. Hardcover books (cloth) have greater price variation than the other two categories, but are fairly tightly grouped in the $24–$28 dollar range.

Older books have considerably greater variation in their prices, as shown in Figure 2. This enhanced variation was more pronounced for the non-copyrighted old books than for the copyrighted old books. This variation can partly be explained by the fact that some publishers of non-copyrighted books seem to specialize in either high-priced or low-priced books.

Figure 2 would seem to indicate that, for the sample of old books, copyrighted works might have somewhat higher prices for mass-market and non–mass market paperbound books, but not for clothbound books. The statistical analysis was consistent with this finding.

Table 1 presents some summary statistics for the data. Note that the period of time runs from 1895 to 1940 for the old books and 2001 to 2004 for the new books. The average book contains approximately 400 pages, with recent books being slightly larger than older books. Book lengths run from 40 pages (children's books) to over a thousand pages, and most books are fiction. Only a third of old books are from major publishers (defined below). On average, former bestsellers appear to be slightly more expensive than new bestsellers. Slightly more than 30 percent of the old books are still under

copyright. Most of the old books are classified as "paper," but most of the new books are hardcover (clothbound).

REGRESSION RESULTS

Although I estimated many regressions relating the price of books to copyright and other variables, I report here the results for regressions that included only old books and that also included dummy variables for publishers because that specification most concisely illustrates the results.

The copyright coefficient in Table 2 indicates, surprisingly, that copyright *lowers* price, although the effect is very small and not statistically significant. Similar results occur whether or not publisher dummies are included and whether or not recent bestsellers are included in the sample.

All the regressions show that, holding the other variables constant, the number of pages is positively related to price, that cloth and library bindings have higher prices than the excluded paperback binding, and that mass-market books have lower prices. Works of fiction and children's books appear to have lower prices than nonfiction or non-children's books. The results are all consistent with expectations.

The results appear to imply that large-print books are lower in price than regular books, which conflicts with casual bookstore observations that large-print editions are more expensive than their normal-print versions. This can be explained by the fact that large-print books have more pages than their regular-print counterparts; the negative coefficient may indicate merely that large-print books have prices that are lower than expected given their extra pages.

Overall, the regressions do not support a view that copyright leads to higher prices for books.

PUBLISHERS One possible cause of the seeming result that copyright has no effect on price is that some publishers do not pay for their use of copyrighted materials — in other words, they are pirate publishers. Indeed, I found various stories on the Web accusing some of the lesser-known publishers in the

Figure 1

Book Buying

List price of 2001–2004 bestsellers by binding
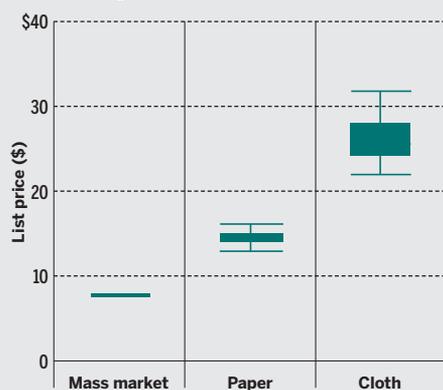
Excludes outside values

Figure 2

Classic Books

List price of 1895–1940 bestsellers

Excludes outside values

Table 1

Bestsellers, Then and Now

Summary statistics for bestsellers from 1895–1940 and 2001–2004

Variable	1895–1940				2001–2004			
	Obs.	Mean	Min	Max	Obs.	Mean	Min	Max
Number of pages	419	371.72	40	1108	153	428.5	48	864
List price	419	26.10	2	135	153	19.8	6.99	32.95
Copyright	419	0.31	0	1	153	1.0	1	1
Fiction	419	0.77	0	1	153	0.5	0	1
Major publisher	419	0.33	0	1	153	1.0	0	1
Clothbound	419	0.20	0	1	153	0.5	0	1
Mass-market paperback	419	0.08	0	1	153	0.2	0	1
Paperback	419	0.55	0	1	153	0.3	0	1
Year published	419	1917.5	1895	1940	153	2002.99	2001	2004

specifications (not shown) there is a slight hint of a possible borderline higher price caused by copyright.

QUANTITIES SOLD? So far, all of these observations, which means every variant of each title, are given equal weight in the statistical analyses. That may not be the correct weighting. It is likely that the expiration of copyright brings many new variants of a title, with some new variants perhaps more expensive and some perhaps less expensive than would be the case with copyright. It is possible, and some would suggest likely, that the bulk of sales occur for the lower-priced variations and that the expiration of copyright therefore leads to most consumers paying lower prices. Thus, according to this view, the previous analysis would not pick up the actual effect of copyright because the previous regressions give each variant of each title equal weight.

This hypothesis can be tested with sales data for each book

sample of violating copyright. If pirate publishers charge low prices and also claim to have copyright, that would bias the regressions into showing a weaker effect of copyright on price than was really the case.

To address that concern, I then limited the sample to books produced by well-known publishers, which are unlikely to intentionally violate copyright. The algorithm I used to restrict publishers was fairly simple. Any publisher of a bestseller in the 2002–2004 period was deemed to be major. Any publisher that was a household name, or at least was one in my household, was deemed a major publisher. Any publisher that came up first in a Google search under its name and had a group of associated URLs underneath the main description was treated as a major publisher. University presses, no matter how major, were not treated as major publishers because they tend to have very different types of books. All other presses were deemed minor and excluded from the analysis. This left a considerably smaller sample.

I then reran the regressions using this reduced sample, and the results are shown in Table 3. The results are basically the same as before, although in some

Table 2

What Affects Book Prices?

Regression on Ln(Price) for bestsellers, clustered

Copyright	-0.0339
	(-0.467)
Number of pages	0.000779***
	(4.517)
Fiction	-0.151**
	(-2.472)
Mass-market paperback	-0.576***
	(-8.935)
Hardcover	0.716***
	(5.831)
Library binding	1.066***
	(4.055)
Children's book	-0.354***
	(-3.075)
Large print	-0.0364
	(-0.460)
Constant	2.491***
	(33.90)
Publisher dummies?	Yes
Observations	419
Adjusted R-squared	0.896

*Robust T statistics in parentheses; ** significant at 5% level; *** significant at 1% level*

Table 3

Major Publisher Book Prices

Regression on Ln(Price) for bestsellers from major publishers, clustered

Copyright	-0.00069
	(-0.009)
Number of pages	0.000947***
	(3.360)
Fiction	-0.267**
	(-3.451)
Mass-market paperback	-0.58***
	(-7.588)
Hardcover	0.724***
	(4.610)
Library binding	0.505***
	(12.75)
Children's book	-0.47***
	(-4.643)
Large print	0.00725
	(0.233)
Constant	2.290***
	(17.34)
Publisher dummies?	Yes
Observations	140
Adjusted R-squared	0.824

*Robust T statistics in parentheses; ** significant at 5% level; *** significant at 1% level*

variant. The weighting can be done two different ways. In the first, I weight the variants of each title so that those variants with larger market shares are given more weight. But each title is weighted identically to every other title. I refer to this as normalized weighting.

In the second, I give better-selling titles more weight than weaker-selling titles, in addition to giving better-selling variants of a title more weight than less-selling ones. Such weighting would be appropriate if copyright's effect on the price of successful titles is different than its effect on less successful titles. For example, potential new entrants might not find the benefits greater than the fixed costs of entering a market for a slow-selling title that has lost copyright protection. Under this scenario, popular titles that have lost copyright are likely to attract a larger number of competing variants, and this might lead to lower average weighted prices than might be the case for less popular titles that have lost copyright.

The regressions in Tables 2 and 3 were re-estimated with both sets of weights — normalized weights based on relative sale units for variants of a single title, and weights based on raw sales of titles. Table 4, which does not present the regression coefficients for variables other than copyright, presents the key results.

Using the normalized weights, the results for the full sample were largely identical to those in Tables 3 — no effect of copyright on price. The coefficients are more strongly positive, but not statistically significant. For the sample of major publishers, the price coefficients (for the specification with publisher dummy variables) are even larger (6.3 percent for old bestsellers and 12.3 percent including the new bestsellers), but also not statistically significant.

Using the raw weights increases the measured effect of copyright relative to the unweighted results, particularly for the overall sample. Unlike the results in Table 3, the effect of copyright on price is positive and significant, ranging from 11.2 percent to 14.8 percent when publisher dummy variables are included. The results are similar for the set of major publishers, ranging from 10.6 percent to 14.5 percent. Again, the results are statistically significant.

The results imply that, when sales quantities are taken into account, copyright has a positive effect on the price of books paid by typical consumers. When titles are treated as equal but title variants are weighted by sales, the positive copyright coefficient is very modest and statistically insignificant. But when titles are weighted by raw sales, allowing the effect of some titles to dwarf that of others, the results indicate more strongly that copyright increases price and the result is statistically significant. This latter result would seem to imply that the effect of copyright on price depends on the size of the market for the title and that minor titles are less likely to experience price declines when copyright is removed.

INTERPRETATION What are we to make of my empirical findings? Contrary to expectations, there is very little evidence that copyright leads to higher prices. Only when raw sales are used as weights are there positive results with statistical significance.

The full sample generally indicated zero or negative effects of copyright on price. Because this sample was tainted with publishers likely to bias the copyright variable downward, we removed the most obscure publishers. Even after that refinement, copyright's effect on price was essentially zero when publisher dummy variables were included in the regression, as seems appropriate. In contrast, when observations were weighted by sales, the copyright coefficients were positive and, in the case of raw sales weights, significantly so.

HOW DOES COPYRIGHT WORK IF IT HAS NO EFFECT ON PRICE?

At first blush it seems impossible that copyright could fail to raise the price. Because royalty payments are paid on a per-book basis (beyond the advance), the marginal cost curve for copyrighted books necessarily would seem to be above that for non-copyrighted books, all else equal.

To understand how this seemingly impossible result might occur requires noticing that, in some markets, prices are uniform even though costs and demand vary. For example, in North America, when you go to a movie theater multiplex showing several different movies, the prices for the movies will be identical, even when it is fairly well known in advance which movies are likely to have large and

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Table 4

Sales and Prices
Select regression statistics, weighted for sales volume

	Amazon weights normalized by title		Raw Amazon sales weights	
	1895–1940 bestsellers	2001–2004 bestsellers	1895–1940 bestsellers	2001–2004 bestsellers
ALL BOOKS				
Copyright variable	0.0302	0.0747	0.112	0.148
T-statistic	(0.236)	(0.685)	(2.249)**	(5.433)***
Publisher dummy	Yes	Yes	Yes	Yes
Includes new bestsellers	No	Yes	No	Yes
Observations	344	491	344	491
MAJOR PUBLISHERS				
Copyright variable	0.0634	0.123	0.106	0.145
T-statistic	(0.730)	(1.499)	(2.025)**	(5.539)***
Publisher dummy	Yes	Yes	Yes	Yes
Includes new bestsellers	No	Yes	No	Yes
Observations	140	287	140	287

** significant at 5% level; *** significant at 1% level

which will have small demands. The most successful movies may be shown on two or three screens at one time to accommodate demand, but the price will not change. It is quantity that adjusts to demand differentials, not price. Similarly, music CDs within a broad range of performer popularity seem to be priced at similar levels. The same is apparently true for video rentals, which seem to only differentiate based on whether the film is considered a "new release." The pricing on Apple's iTunes website, where until recently each and every song sold at the same price, is another example.

How, the reader may ask, can publishers of copyrighted books afford to pay royalties to authors when they must charge the same uniform price when competing with publishers of non-copyrighted books? The answer, to use a variation of a quaint aphorism, is that they make up for their lower margins with their higher volumes.

To see how this works, we need to consider a world, like the movie world, where retail prices are uniform for every title. For such a model to work, there needs to be a fixed cost per publisher (which certainly appears realistic) that is likely to include manuscript preparation and typesetting costs. The entry of additional publishers of a given title lowers the quantity sold for the representative seller of that title and therefore increases the average costs of producing the title. With a fixed (uniform) price, an increase in average cost lowers profits per unit, and with fewer units overall, profits for the representative firm fall. Entry continues until all profits are removed. In this world, instead of the price of the title falling as entry occurs, quantity sold per firm falls, as does profit per firm.

In such a world, the deadweight losses associated with copyright no longer apply. Copyright provides an advantage of lower average (fixed) costs (and higher profit) that goes along with the larger quantity for the single seller of the title. In other words, because there are some fixed startup costs in printing a book, it is inefficient to have more than one producer of a given title. In this world, copyright enhances efficiency and allows authors to be paid from the efficiency savings.

Note the remarkable implication: enhancements to copyright increase the incentive to write new titles, but they do not reduce the consumption of books that are written. Marginal increases in copyright, by which I mean changes that do not alter the share of copyrighted books purchased by very large amounts, are unambiguously positive for social welfare.

Left out of the story so far is the competition between titles, which moves the demand curve for any given title. We would expect competition among titles to reduce the demand facing the representative title to a point where only normal returns can be earned. Book publishing, however, is thought to be one of those industries where there is great variability in performance, meaning that most titles fail to earn any profits, analogous to finding a dry hole when drilling for oil. There will, however, be a small number of authors whose talents are not easily duplicated, and their books will generate positive rents. If publishers compete among themselves to sign authors, the authors will, in fact, earn all or most of the monopoly rents in the system. In this world, it seems almost impossible to have a logical objection to copyright.

IF COPYRIGHT RAISES PRICE…

The standard textbook models of copyright as a price-raising monopoly can be resurrected if one accepts the view that weighted estimates are more reliable indicators of the effect of copyright and that raw weights are most appropriate. This belief is best rationalized by appealing to the fixed costs for a publisher to print a new title, implying a minimum efficient scale of production. Slow-selling titles, in this case, may not provide sufficient sales for an entering publisher to cover those costs and may not draw much, if any, competitive entry. Thus the removal of copyright may have a weaker effect on price for slow-selling titles than for better-selling titles. Weighting the regression by overall units sold would appropriately reveal the effect of copyright.

The quantity-weighted results implied that copyright's effect on book prices might be as high as 14.5 percent. What does a price differential of that magnitude imply about copyright's efficiency? Such a question obviously fits into the policy debates currently swirling around copyright. The fact that all the books in the sample are bestsellers implies that royalty rates for authors will be at the high end of the averages and will have escalated to the highest step (authors' royalty contracts usually have increasing royalty rates as sales volumes increase). Therefore, the payment to the author is probably at least 15 percent of the list price, which appears to have been a higher-end rate for the last 150 years. This is about the same as the largest estimate of a price differential caused by the copyright found in the regressions. Hence, after removing the payment to the author, publishers of copyright books receive a price no higher than the competitive price. This is consistent with a conclusion that publishers compete away all the rents and authors receive all the rents.

DEADWEIGHT LOSS How large, under these circumstances, would be the deadweight loss from copyright? And how does the deadweight loss from copyright compare to alternative real-world mechanisms for rewarding authors?

After making a few simplifying assumptions, we can estimate the size of the deadweight loss. First, I assume a horizontal marginal cost curve because information industries are generally thought to have relatively constant marginal costs. I also assume that the demand curve, at least in the vicinity of the market equilibrium, is essentially linear.

In this case, the deadweight loss is merely a right triangle with the height equal to the increase in price and the base equal to the decrease in quantity (which can be inferred by the slope of the demand and the increase in price). The area, which is half the product of the base and height, then provides the deadweight loss measured as a share of total revenue.

Table 5 indicates the size of the deadweight loss for various assumptions about elasticity and the copyright price effects. Elasticities are chosen in a range from 0.5 to 4.0, the range found in the literature examining book publishing. The deadweight losses in the table are often considerably less than 1 percent. For the largest estimates of price increases, the deadweight losses are a handful of percentage points, growing with the elasticity.

Table 5

Deadweight Loss from Copyright

Deadweight loss as percentage of revenue

Arc elasticity of demand	Copyright price enhancement (percent)			
	3.750	7.500	11.250	15.000
0.5	0.035	0.141	0.316	0.563
1	0.070	0.281	0.633	1.125
2	0.141	0.563	1.266	2.250
3	0.211	0.844	1.898	3.375
4	0.281	1.125	2.531	4.5

Are such magnitudes large compared to the alternatives? Critics of copyright (e.g., Harvard's William Fisher) suggest replacing it with a licensing system in which a government-organized agency would collect "tax" revenues to pay copyright owners based on measures of usage. The proposal emulates the music performing rights societies (e.g., ASCAP) that currently distribute to copyright owners billions of dollars that they collect from licenses sold to radio broadcasters, television broadcasters, and other major users of copyrighted works. Under such a system, publishers of works would not have to pay anything directly to the copyright owner and thus, in principle, the price of copyrighted works would be driven down to the costs of delivering the work to the consumer. The underconsumption problem associated with copyright would then be eliminated.

This still leaves the incentive problem to be dealt with. The hope in these proposals is that government can in some miraculous way divine how much money should be collected through taxation and paid to creators. An additional problem is how to distribute the tax proceeds among the thousands, nay millions, of creators.

Because the underconsumption problem is avoided with copyright's removal, the deadweight loss in the market for title reproductions is thought to be zero. But because this proposal is a real-world proposal, it comes with its own set of costs. First, the taxes cause deadweight losses of unknown magnitude. Second, the mechanism to disburse revenues has a cost as well.

Using the performing rights organizations' costs as a proxy for disbursement costs would imply costs in the vicinity of 15–20 percent of revenues. Although these organizations spend some resources policing users to make sure they purchase required licenses, the major costs of operation consist of monitoring usage of music, determining which creators gets paid and how much, and lobbying the "taxing authority" for higher payments. Those costs would all exist in any new organization meant to replace copyright.

Even ignoring the welfare costs from having too much or too little creation of copyright works and the deadweight loss from the taxes, the roughly 20 percent cost of collecting and distributing the revenues (and the inevitable rent seeking involved in trying to increase the size of government-con-

trolled monies) appears to be much larger than the likely deadweight loss from copyright found in Table 5. Because the likely deadweight losses from a copyright-alternative system will probably be considerably greater than just the costs involved in running such a system, the unnecessary deadweight loss from such a system appears to be far higher than the current system.

CONCLUSION

When the prices of current editions of copyrighted and non-copyrighted former bestsellers are compared, there is no clear evidence that copyright increases the price of books, a finding that I believe is likely to surprise many people. When books are given equal weight in the statistical analysis, I find no evidence of a price increase. When books are weighted by quantity sold, copyright appears to increase the overall price by no more than a fairly small 15 percent.

An explanation for the first result, that copyright does not increase the price of books, can be found by analogizing results that occur in other copyright markets, such as the movie exhibition market. By amortizing fixed costs over a larger output, the copyright owner of bestsellers has lower average costs and thus, like any natural monopoly, it is more efficient to have only a single producer of the title. Therefore the deadweight loss associated with higher prices normally caused by monopolies does not apply in the uniform pricing case. A remarkable conclusion, under these circumstances, is that marginal increases in copyright can only increase welfare.

The explanation for the second result uses a more traditional textbook view of copyright as a monopoly and concludes, based on regressions weighted by sales of books, that the price increase caused by copyright is no more than 15 percent. In this case, there were two interesting conclusions. First, the empirical estimates imply that authors get virtually all the rents, and publishers get none. Second, the deadweight loss caused by the higher-priced copyrighted works was likely to be no more than a few percentage points of industry revenues. The deadweight loss from the current copyright regime, therefore, appears to be very small in comparison to the deadweight losses likely under the major proposed alternative. **R**

Readings

■ "Elementary and Persistent Errors in the Economic Analysis of Intellectual Property," by Edmund W. Kitch. *Vanderbilt Law Review,* Vol. 53 (November 2000).

■ "Is the Copyright Monopoly a Best-Selling Fiction?" by Stan J. Liebowitz. SSRN working paper 1266486, September 11, 2008.

■ "MP3s and Copyright Collectives: A Cure Worse than

the Disease?" by Stan J. Liebowitz. In Developments in the *Economics of Copyright: Research and Analysis,* edited by Wendy Gordon, Lisa Takeyama, and Ruth Towse (Edward Elgar, 2005).

■ *Promises to Keep: Technology, Law, and the Future of Entertainment,* by W. W. Fisher. Stanford University Press, 2004.